

Hello and welcome to the Teensy TouchDAW

Functions:

16step long clips (8 of them for each of the 8 Tracks) can be arranged to a complete arrangement of a song.

The 8 Tracks will also be able to send their Notes to internal Audio-Plugins. So you can make your music without the need of any external musical gear.

As this is still a project under Development, things may change over time.

Please refer to Github <https://github.com/steven-law/Teensy-DAW> for the latest releases and informations.

Many thanks to Tristan Rowley, without his immense efforts and time to explain things to me, this project would have never reached this amount of functions and still have a more or less readable code. For more information on him, please take a look at [www.github.com/doctea](https://www.github.com/doctea) and [www.doctea.co.uk](https://www.doctea.co.uk)!! Very Interesting stuff to find and try out!!!

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## 1. Terminology:

Song / Arrangement	this is your arrangement to build the songstructure, a song consists of the 8 tracks and their clips
Track	this is one of the 8 "parts" of the song, the first track is dedicated to drums, the others are meant for monophonic (for now) melodic sounds, a track can hold up to 8 individual clips
Clip	this is one of the 8 individual sequences per track that you can arrange in songmode.
Sequence	at this point a clip consists of a 16-step sequence.
Plug-in	these are internal sound engines, up to 32 can be created. Each Plug-in can store up to 8 Presets.
bar-components	in songmode you can set: <u>ClipNr</u> , <u>Note-transpose</u> , <u>PresetNr</u> , <b>velocity for each bar</b> .

### Things that should be known / wont be mentioned in the manual:

- Yellow areas are useful tipps for you
  - Red areas are important notes
  - Cyan areas are buttons to press
- 
- After startup, you have to set a tempo in songmode
  - Touchinput is not working properly at the moment
  - RAW files are always mono
  - grayed-out Photos in this manual are outdated Pictures
  - "Touch" is referred to a touchinput or the desired cursor-position and pressing the "enter-button". Some Pages are easy to access by button combinations, please refer to the chart below "Button Navigation".
  - Push and turn the Encoder to change the values by a factor of 8x.

### Button-Navigation:

Track	“Track-Button” and one of the <b>above 8 Buttons</b>
Plugin	“Plugin-Button” and one of the <b>above 8 Track-Buttons</b> where the desired Plugin is loaded
Songpage	“Song-Button” and one of the <b>16 Buttons</b> . If you just hit “Song-Button”, this will lead you to SongPage 11
Mixerpage	“Mixer-Button” and one of the first 3 Buttons.
Effectpage	“FX-Button” and one of the first 3 Buttons.
Recorder	“SMP-Button”

### Encoder-Assignment:

	Enc1	Enc2	Enc3	Enc4		
<b>Songmode:</b>	X	Y	Start	End		
shift:	Tempo					
enter:	Clip	transpose	preset	Volume		
<b>Drumtrack:</b>	X	Y	Clip	Channel		
shift:	note on row					
<b>Track 2-8:</b>	X	Y	Clip	Channel		
shift:	Octave					
<b>Mixer:</b>	1/5	2/6	3/7	4/8		
shift	Output					
<b>Midi CC</b>	1/5/9/13	2/6/10/14	3/7/11/15	4/8/12/16		
shift	CC Number	CC Number	CC Number	CC Number		
<b>Plugins</b>	Controls	Controls	Controls	Controls		
shift:	Preset					



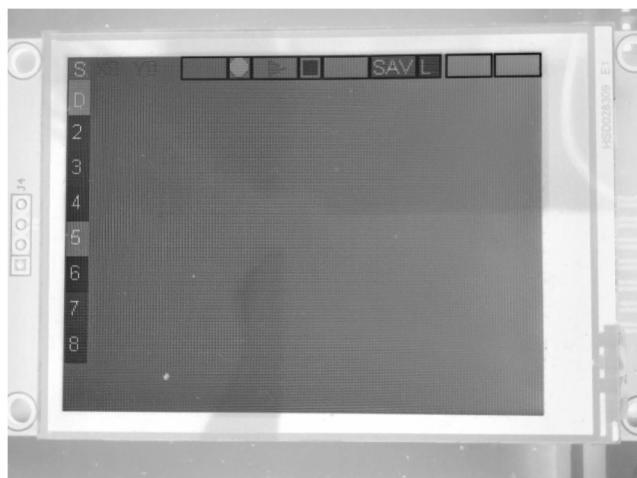
## 2. Overview

### 2.1. Hardware:

- 1x Touchdisplay
- 4x Encoders
- 16x Buttons
- 1x Sync I/O -> L/R (not working atm)
- 1x Stereo Audio In Jack (Left input assigned atm)
- 1x Stereo Audio Out Jack
- 1x MIDI TRS Type A (Korg, Roland,...)
- 1x USB Type A (USB Host)
- 1x Headphone Jack

### 2.2. GUI

This is the Startup Screen after powering up the module.



On the top Row you have some general Settings and Views: from left to right

Grid Coordinates	shows what coordinates the cursor is on (moved by Encoders, Touch Input or Cursor buttons)
Bar Counter	shows the current bar
Record	record your sequences from ext Keyboard into chosen Track and clip.
Play Button	to start playback

Stop Button	to stop playback
Tempo	shows the selected Tempo <b>You have to set a tempo after startup!!!</b>
Save Button	to store the *actual information on a SD card.
Load Button	to load the *actual information from a SD card.
Scale Select	Greys out the notes if they are not within the selected scale. There is no quantisation happening!
Arrangementselect	Not implemented yet, but you will be able to select from 8 different arrangements.

\*in Songmode you will save the whole project, in any other page you will save the according content. The files on the sd card are stored with ASCII Symbols, so don't try to use them anywhere else then a Teensy Touch DAW Device. The Recorded RAW files are generic RAW files and can be played on any other RAW file player. The recorded MIDI files are generic MIDI files and can be used with any DAW or MIDI file player.

List what stuff is saved where:

On the left side you can select between the different Pages and Tracks:

- „S“ Song arrangement
- „D“ Drumtrack (Poly) (12note range)
- „2“ Melodic track (Mono) (10 Octaves range)
- „3“ Melodic track (Mono) (10 Octaves range)
- „4“ Melodic track (Mono) (10 Octaves range)
- „5“ Melodic track (Mono) (10 Octaves range)
- „6“ Melodic track (Mono) (10 Octaves range)
- „7“ Melodic track (Mono) (10 Octaves range)
- „8“ Melodic track (Mono) (10 Octaves range)
- "M" Mixerpage

### 3. Songmode “S”

Press **Song Button** and one of the 16 buttons to enter one of the 16 Songpages. if you press Songmode alone, you will enter Sonpage Nr 11.

Controls:	Enc1	Enc2	Enc3	Enc4
	X-cursor	Y-cursor	Loopstart	Loopend
Shift Button	Tempo			
Enter Button	ClipNr	Note-trans.	PresetNr	Volume

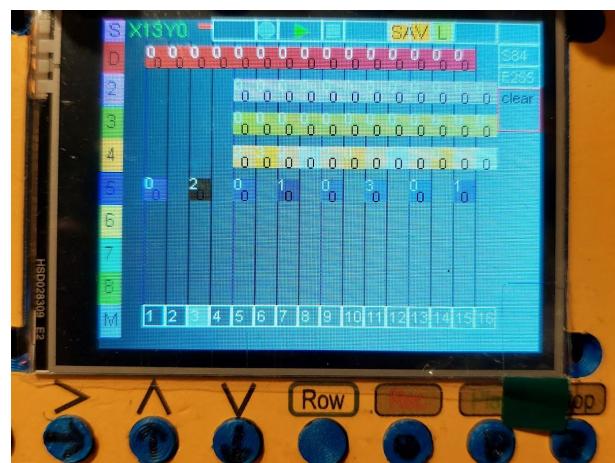
In this view you will be able to arrange your clips to a complete song.  
An arrangement consists of the 8 tracks that are filled with different clips.  
Each clip in the arrangement runs for 16 steps (= 1 bar) before it can switch to the next clip.  
The next clip can be the same as before or any of the other 7 clips that are provided within the track. A song can be up to 256 bars long.

**Clips from Tracks A cannot be played at Track B!**

In Songmode you also can loop a region of your song.

Select Songmode and this window will open up. This is the arrangement of the first 16 bars.

On the right side, you will find Settings for this page and active clip:



Loop start (in bars)

Loop end (in bars)

Clear Button

PresetNr per Clip

Velocity per Clip

Songmode page 1-16

Songposition pointer: song, bar, step

On the bottom you will find 16 pages for each 16 bars = 256 bars.

“Touch” a track’s Clip to select its bar-components: ClipNr, Note-transposition, PresetNr, Velocity. (see the Encoder chart for further informations). Hit Rec Button to copy the bar-components to the next clip of the track.

For each track you can select between the clips 0-7. The last clip (8) is an empty clip that is used if no clip should be played at this bar.

“Touch” the Clearbutton to clear the entire Arrangement. Clips and Presets are still stored.

#### 4. Drum-Track “D”

Press **Track Button** and the **first button** from the above row to enter the Drum-Trackview.

Controls:	Enc1	Enc2	Enc3	Enc4
	X-cursor	Y-cursor	Channel	ClipNr
<b>Shift Button</b>	MIDI-Note			

In this View you can set the active steps for your Drum-Track.

For now, this is the only polyphonic track in the DAW.



“Touch” some steps on the grid to activate the desired steps.

Set your pointer on an instrument-lane, press **Shift Button** and turn the **first Encoder** to select the desired MIDI-Note for this instrument.

You can set all instrument lanes to different Notes.

This is useful for the variety of drum machines (thinking of Bitwigs-Drum Track, or the force's/mpc's drum track, Volca Beats and of course the general MIDI Percussion Key map).

On the right top you see your actual ClipNr, turn the 4th Encoder to switch between the clips.

On the right bottom you can set your MIDI-channel with the 3rd Encoder for this track. If Channel 1-16 is selected, the notes will be sent out to your

DAW/MIDI-Instruments, If Channel 17 and above is chosen, it will select one of the internal plugins. A short name of the plugin is shown.

Please note: Though it is possible, it makes almost no sense to use a melodic Plug-in on a Drumtrack and vice versa. The desired tracks won't play the other plugins anyway.

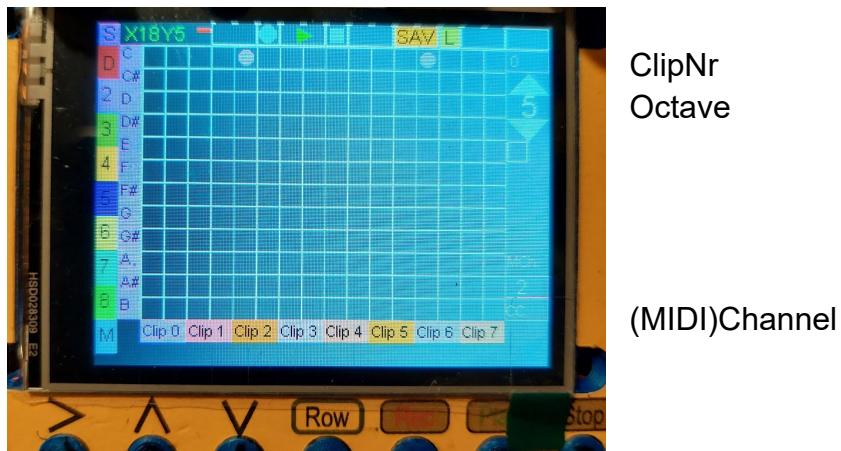
## 5. Melodic Track “2-8”

Press **Track Button** and the **second to last button** from the above row to enter the Melodic-Trackview.

Controls:	Enc1	Enc2	Enc3	Enc4
	X-cursor	Y-cursor	Channel	ClipNr
Shift Button	Octave			

In this View you can set the active steps for your melodic tracks.

These tracks only work Monophonic for now!



With **Shift Button** and turning the **first Encoder** or with the octave switches on the right you can set your active Octave.

On the right top you see your actual ClipNr, turn the 4th Encoder to switch between the clips.

On the right bottom you can set your MIDI-channel with the 3rd Encoder.  
If Channel 1-16 is selected, the notes will be sent out to your DAW/MIDI-Instruments,  
If the Channel is above 17, it will select one of the internal plugins.

Please note: Though it is possible, it makes almost no sense to use a melodic  
Plug-in on a Drumtrack and vice versa. The desired tracks won't play the other  
plugins anyway.

## 6. Mixer Page “M”

### 6.1. Mixer Page 1

Press **Mixer Button** and the **first button** from the above row to enter the Mixer-Page 1 view.

Controls:	Enc1	Enc2	Enc3	Enc4
	Gain D/5	Gain 2/6	Gain 3/7	Gain 4/8
Shift Button				



Gain Track 1-4

Mute/Solo

Gain Track 5-8

Mute/Solo

Adjust the Overall Volume of your tracks. See this as a kind of GAIN-Stage from your Mixing console, where the Volume never exceeds the GAIN. (Fe. Gain in Mixerpage is set to 50% and Volume from Arrangement is 50%, overall Volume is 25%).  
(Not implemented yet, but Solo/mutes will be changed to handle easier)  
By now, “Touch” the Buttons on the screen

### 6.2. Mixer Page 2

Press **Mixer Button** and the second button from the above row to enter the Mixer-Page 1 view.

Controls:	Enc1	Enc2	Enc3	Enc4
Row1	Dry D	Dry 2	Dry 3	Dry 4
Row2	FX1 D	FX1 2	FX1 3	FX1 4
Row3	FX2 D	FX2 2	FX2 3	FX2 4
Row4	FX3 D	FX3 2	FX3 3	FX3 4

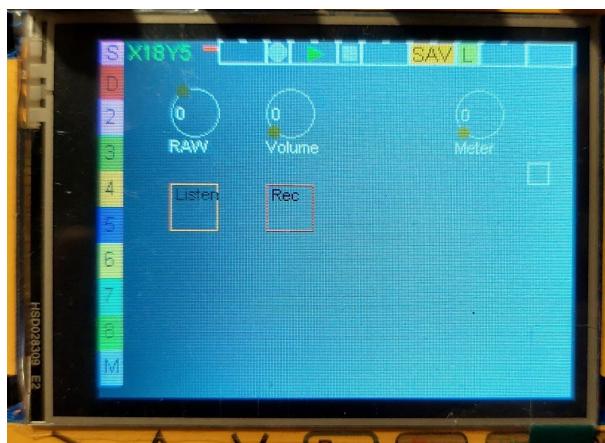
### 6.3. Mixer Page 3

Press **Mixer Button** and the second button from the above row to enter the Mixer-Page 1 view.

Controls:	Enc1	Enc2	Enc3	Enc4
Row1	Dry 5	Dry 6	Dry 7	Dry 8
Row2	FX1 5	FX1 6	FX1 7	FX1 8
Row3	FX2 5	FX2 6	FX2 7	FX2 8
Row4	FX3 5	FX3 6	FX3 7	FX3 8

## 7. Audio Recorder

Press **SMP-Button** to enter the Audio Recorder view.



Here you can sample and store up to 128 RAW file samples, generated by the Audio-Input Jack on the Topside of the Device.

#### **“Listen” / Monitoring:**

Connect a Line In source to the Audio jack, “Touch” **“Listen-Button”** and set your desired Volume so the top right Level-Meter doesn't reach full scale.

#### **Recording:**

“Touch” Rec once to start recording, “Touch” again to stop the process.

**As Raw files are always stored in Mono only, there is only the left Audio input detected by the software.**

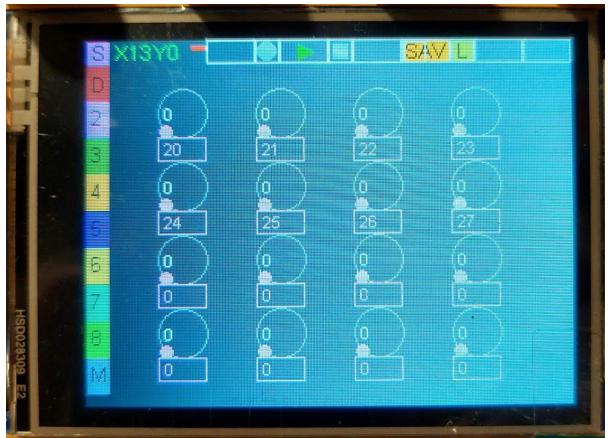
## 8. Plugins

Choose one of the below Plug-ins to select and activate for this track. If an internal Sound engine is chosen (Ch17+), there will be NO MIDI Notes sent anymore.

### 8.1. Ch1-16 MIDI CC

This gives you a set of 16 free assignable MIDI control commands. For each control you can set the CC Number and CC Value.

To change CC Number hold shift and turn the desired Encoder.



CC Value  
CC Number

### 8.2. Ch17 “Chrd”

Generates up to 4 Waveforms/Voices. You can set these Parameters for each Voice on the first page:

1. NoteOffset
2. Waveform
3. Volume



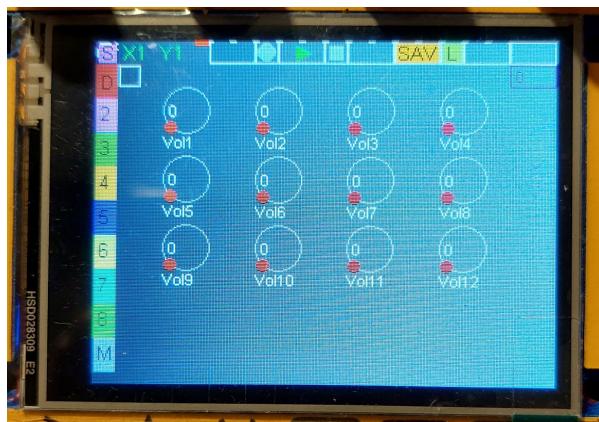
on the second Page you have control over

1. Filterfrequency, Resonance, Sweep, Filtertype
2. Attack, Decay, Sustain, Release



### **8.3. Ch18 "SDrm"**

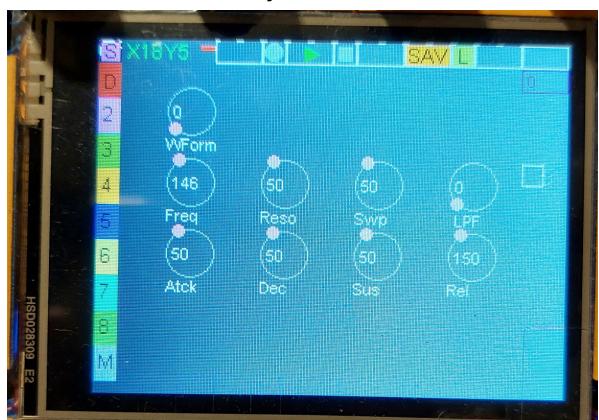
A 12voice sample Player meant to play drumsounds. Control the Volume of each voice.  
(At the moment the sample Files are hardcoded, but it is possible to change it, if wanted).



### **8.4. Ch19 "1OSC"**

A simple 1x Oscillator synth voice with control over

1. Waveform
2. Filterfrequency, Resonance, Sweep, Filertype
3. Attack, Decay, Sustain, Release



## **8.5. Ch20 “MDrm”**

A 12voice sample Player meant to play drumvoices. Control the Volume of each voice.  
(At the moment the sample Files are hardcoded, but it is possible to change it, if wanted).



## **8.6. Ch21 “RAW1”**

A simple RAW file sampleplayer synth voice with control over

1. RawFile, LOAD(sample)
2. Filterfrequency, Resonance, Sweep, Filtertype
3. Attack, Decay, Sustain, Release

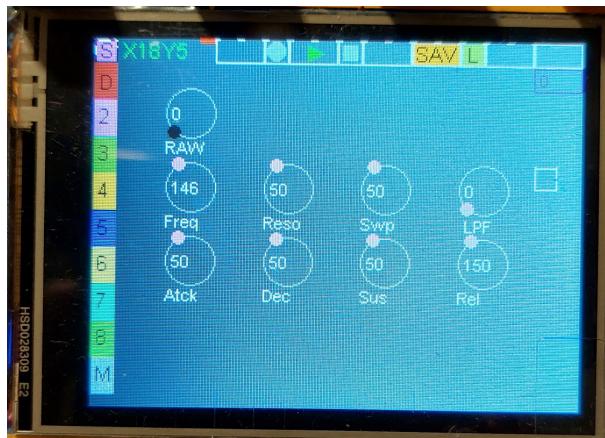


The difference to the other RAW2 file Player, is that it flashes the raw file into the Flash memory of the Teensy after hitting the “LOAD” button. The teensy then can process the sound much faster than without flashing

## **8.7. Ch22 “RAW2”**

A simple RAW file sampleplayer synth voice with control over

1. RawFile
2. Filterfrequency, Resonance, Sweep, Filtertype
3. Attack, Decay, Sustain, Release



The difference to the other RAW file Player, is that it DOES NOT flash the raw file into the Flash memory of the Teensy. The Teensy needs more time to process the file. (In practice i didn't noticed any difference.)

## **8.8. Ch23 "Drum"**

An (atm incomplete) Drumsynth with 8 different “percussion-engines”. Various parameters depending on the engine can be applied.

(From the latter 5 engines the controllers are not implemented yet.)

## **8.9. Ch24 "MogL"**

A simple 1x Oscillator synth voice with control over

1. Waveform
2. Filterfrequency, Resonance, Sweep
3. Attack, Decay, Sustain, Release
- 4.

The difference to 1OSC is that it uses a different filter. Only Low Pass Filter available.



## **8.10. Ch25 "String"**

8.11. k

8.12. k

8.13. k

8.14. k